IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Biswaroop Mukherjee
Serial No. 10/599,802
Attorney Docket No. 7000-365-1A
Filed: 10/10/2006
For: **INDEPENDENT SCHEDULING IN A WIRELESS NETWORK**

Examiner: Nizar N. Sivji
Art Unit: 2617

Mail Stop Appeal Brief – Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

An **APPEAL BRIEF** is filed herewith. Appellant encloses a payment in the amount of $540.00 as required by 37 C.F.R. § 41.20(b)(2). Appellant also encloses a payment of $490.00 for a two-month extension of time and requests that this be considered a petition therefor. If any additional fees are required in association with this appeal brief, the Director is hereby authorized to charge them to Deposit Account 14-1315, and consider this a petition therefor.

(1) REAL PARTY IN INTEREST

The real party in interest is the assignee of record, i.e., Nortel Networks Limited of 2351 Boulevard Alfred-Nobel, St. Laurent, Quebec Canada H4S 2A9, which is wholly owned by Nortel Networks Corporation, a Canadian corporation.

(2) STATUS OF CLAIMS

Claims 1-34 were rejected with the rejection made final on March 16, 2010.

Claims 1-34 are pending and are the subject of this appeal.

(3) STATUS OF AMENDMENTS

All amendments have been entered to the best of Appellant's knowledge. No amendments have been filed after the Final Office Action mailed March 16, 2010.

(4) SUMMARY OF CLAIMED SUBJECT MATTER

In the following summary, Appellant has noted where in the Specification certain subject matter exists. Appellant wishes to point out that these citations are for demonstrative purposes only and that the Specification may include additional discussion of the various elements, citations to which are not pointed out below. Thus, the noted citations are in no way intended to limit the scope of the pending claims.

Embodiments described in the present application provide a scheduling technique that allows individual nodes in a wireless communication network to independently determine their own communication schedules (Specification, paragraph 0007). The communication nodes in the wireless communication network are associated with one or more compatible communication nodes through a shared communication medium. Id. The shared medium may be turned into a set of substantially non-contending communication links, wherein the communication links within a group of compatible communication nodes are substantially non-interfering. Id. Each node will exchange scheduling information with the various compatible communication nodes, and determine the communication schedule for future communications with those compatible communication nodes. Id. This communication schedule defines a series of transmission

opportunities and dictates when information is received from or sent to a compatible communication node during a given transmission opportunity. Id.

Traffic scheduling for each compatible communication node may be done in a serial fashion to avoid conflicting schedules (Specification, paragraph 0008). The communication schedule may include transmission opportunities for forwarding data traffic, for negotiating future scheduling, or for a combination thereof. Id. In one embodiment, each of the communication nodes has an independent clock, which is not synchronized with the clocks of other compatible communication nodes or a common reference clock. Id.

Independent claim 1 recites a method comprising:

- exchanging scheduling information with at least one compatible communication node (such as any of compatible communication nodes 16, Figures 1-6) in a wireless communication network (such as wireless access network 14, Figure 1) (Specification, paragraphs 0007-0009, 0019, 0020, 0022-0026, 0028-0032, 0038-0040, and 0042-0045; see also Figures 1-6);
- determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information (Specification, paragraphs 0007, 0008, 0021-0025, 0027-0035, 0040, and 0043; see also Figures 2-4); and
- communicating with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes (Specification, paragraphs 0007, 0008, 0021-0025, 0027-0035, 0037, 0038, 0040, and 0043; see also Figures 2-4).

Independent claim 18 recites a communication node (such as any of compatible communication nodes 16, Figures 1-6) comprising:

- at least one wireless communication interface (such as communication interface 28, Figure 6; see also Specification, paragraph 0045); and
- a control system (such as control system 20, Figure 6; see also Specification, paragraph 0045) associated with the at least one wireless communication interface and adapted to:

- exchange scheduling information with at least one compatible communication node in a wireless communication network (Specification, paragraphs 0007-0009, 0019, 0020, 0022-0026, 0028-0032, 0038-0040, and 0042-0045; see also Figures 1-6);
- determine a communication schedule for communications with the at least one compatible communication node based on the scheduling information (Specification, paragraphs 0007, 0008, 0021-0025, 0027-0035, 0040, and 0043; see also Figures 2-4); and
- communicate with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes (Specification, paragraphs 0007, 0008, 0021-0025, 0027-0035, 0037, 0038, 0040, and 0043; see also Figures 2-4).

Certain dependent claims are argued separately. For example, claim 9 depends from claim 1 and recites the additional limitation of "wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another." Claim 26 depends from independent claim 18 and recites a similar limitation. Support for this limitation may be found in at least paragraphs 0037-0040 of the Specification

(5) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 5 and 22 were properly rejected under 35 U.S.C. § 112, second paragraph, for the claim term "in serial fashion" allegedly being indefinite.

B. Whether claims 1, 6-8, 11-13, 16-18, 23-25, 28-30, 33, and 34 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent No. EP 1059773 A2 to Itai et al. (hereinafter "Itai") in view of U.S. Patent Application Publication No. 2005/0232224 to Belschner et al. (hereinafter "Belschner").

C. Whether claims 2-4, 14, 15, 19-21, 31, and 32 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent No. 6,788,702 to Garcia-Luna-Aceves et al. (hereinafter "Garcia").

D. Whether claims 5 and 22 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and Garcia and further in view of U.S. Patent No. 6,542,476 to Elizondo et al. (hereinafter "Elizondo").

E. Whether claims 9 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2003/0067873 to Fuhrmann et al. (hereinafter "Fuhrmann").

F. Whether claims 10 and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2004/0176098 to Besset-Bathias et al. (hereinafter "Besset-Bathias").

(7) ARGUMENT

A. Introduction

Claims 5 and 22 are not indefinite under 35 U.S.C. § 112, second paragraph, for using the term "in a serial fashion." One of ordinary skill in the art having read the Specification (particularly paragraphs 0007, 0008, and 0041) would know what is meant by the term "serial fashion." Appellant is using the term "in a serial fashion" in its ordinary meaning. "In a serial fashion" simply means that it is done in series (*i.e.*, not in parallel, or at the same time). Since Appellant is relying on the ordinary meaning of "in serial fashion," the Patent Office's arguments on pages 11-12 of the Final Office Action mailed March 16, 2010 that Appellant has not redefined the term in the Specification is misplaced. In light of the above arguments, Appellant respectfully submits that the rejection of claims 5 and 22 under 35 U.S.C. § 112, second paragraph be withdrawn.

The Patent Office has not shown where all the elements of the pending claims are shown in the prior art with sufficient particularity to sustain an obviousness rejection. The combination of Itai and Belschner fails to teach or suggest each and every limitation of independent claims 1 and 18. The combination of Itai and Belschner does not teach or suggest "exchanging scheduling information with at least one compatible communication node" and "determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information," as recited in the claimed invention. In particular, the nodes in Itai are not configured only to communicate with select **compatible** communication

nodes. Itai is silent as to **compatible** network nodes. Belschner does not cure the deficiencies of Itai in this regard.

In addition, the combination of Itai and Belschner does not disclose or suggest "wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes." The Patent Office admits that Itai does not teach or suggest that the communication nodes **independently** determine communication schedules with compatible communication nodes, but argues that the Belschner discloses this limitation (Final Office Action mailed March 16, 2010, p. 3). Belschner also does not teach or suggest that the communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes, as recited in claim 1. Belschner teaches that a **common** schedule must be determined and therefore Belschner does not disclose or suggest that the communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes, as recited in claim 1. Thus, the combination of Itai and Belschner does not teach or suggest "wherein communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes," as recited in claim 1. Claim 1 is patentable for this additional reason. Independent claim 18 recites a similar limitation and is thus patentable for at least the same reasons.

Dependent claims 2-17 and 19-34 are patentable based on their dependency from independent claims 1 or 18. None of the other cited references cure the deficiencies of Itai and Belschner. In addition, claims 9 and 26 recite a separate limitation not taught by the combination of cited references. In particular, Fuhrmann does not disclose "wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another," as recited in claims 9 and 26. Claims 9 and 26 are patentable for this additional reason.

B. Legal Standards For Establishing Obviousness

Section 103(a) of the Patent Act provides the statutory basis for an obviousness rejection and reads as follows:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Courts have interpreted 35 U.S.C. § 103(a) as a question of law based on underlying facts. As the Federal Circuit stated:

> Obviousness is ultimately a determination of law based on underlying determinations of fact. These underlying factual determinations include: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) the extent of any proffered objective indicia of nonobviousness.

Monarch Knitting Mach. Corp. v. Sulzer Morat GmBH, 45 U.S.P.Q.2d (BNA) 1977, 1981 (Fed. Cir. 1998) (internal citations omitted).

Once the scope of the prior art is ascertained, the content of the prior art must be properly combined. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demand known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006). "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l v. Teleflex, Inc.*, 550 U.S. 398, 418, 82 U.S.P.Q.2d (BNA) 1385, 1396 (2007).

While the Patent Office is entitled to give claim terms their broadest reasonable interpretation, this interpretation is limited by a number of factors. First, the interpretation must be consistent with the specification. *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000); M.P.E.P. § 2111. Second, the broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. Finally, the interpretation must be reasonable. *In re Cortright*, 165 F.3d 1353, 1359 (Fed. Cir. 1999); M.P.E.P. § 2111. This means that the words of the claim must be given their plain meaning unless the applicant has provided a clear definition in the specification. *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989).

When rejecting a claim under § 103, the Patent Office must either show that the prior art references teach or suggest all limitations of the claim or explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 U.S.P.Q.2d (BNA) 1385, 1396 (2007). To establish *prima facie* obviousness, the Patent Office must show where each and every element of the claim is taught or suggested in the combination of references. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. (BNA) 580 (CCPA 1974). The gap between the prior art and the claimed invention may not be "so great as to render the [claim] nonobvious to one reasonably skilled in the art." *Dann v. Johnston*, 425 U.S. 219, 230, 189 U.S.P.Q. (BNA) 257, 261 (1976). If a claim element is missing after the combination is made, then the combination does not render obvious the claimed invention, and the claims are allowable. If the PTO fails to meet this burden, then Appellant is entitled to the patent. *In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002).

C. Claims 5 and 22 Are Not Indefinite

Claims 5 and 22 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. In particular, the Examiner states that it is not clear what is meant by the claim term "in serial fashion." (Final Office Action mailed March 16, 2010, p. 2).

In reviewing a claim for compliance with 35 U.S.C. § 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. § 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. See, e.g., *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 U.S.P.Q.2d (BNA) 1279, 1283 (Fed. Cir. 2000). The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. § 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement. M.P.E.P. § 2173.02.

In the present case, Appellant respectfully submits that one of ordinary skill in the art having read the Specification (particularly paragraphs 0007, 0008, and 0041) knows what is meant by the term "serial fashion." Appellant is using the term "in a serial fashion" in its ordinary meaning. "In a serial fashion" simply means that it is done in series (*i.e.*, not in parallel, or at the same time). Since Appellant is relying on the ordinary meaning of "in serial fashion," the Patent Office's arguments on pages 11-12 of the Final Office Action mailed March 16, 2010 that Appellant has not redefined the term in the Specification is misplaced. In light of the above arguments, Appellant respectfully submits that the rejection of claims 5 and 22 under 35 U.S.C. § 112, second paragraph be withdrawn.

D. Claims 1, 6-8,11-13, 16-18, 23-25, 28-30, 33, and 34 Are Patentable

Claims 1, 6-8, 11-13, 16-18, 23-25, 28-30, 33, and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent No. EP 1059773 A2 to Itai et al. (hereinafter "Itai") in view of U.S. Patent Application Publication No. 2005/0232224 to Belschner et al. (hereinafter "Belschner"). In order to establish *prima facie* obviousness, "[a]ll words in a claim must be considered" and all limitations must be taught or suggested by the prior art. MPEP § 2143.03, In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Embodiments described in the present application provide a scheduling technique that allows individual nodes in a wireless communication network to independently determine their own communication schedules. In one embodiment, the communication nodes in the wireless communication network are associated with one or more compatible communication nodes through a shared communication medium. In one or more of the described embodiments, each node will exchange scheduling information with the various compatible communication nodes, and determine the communication schedule for future communications with those compatible communication nodes. In another embodiment, each of the communication nodes has an independent clock, which is not synchronized with the clocks of other compatible communication nodes or a common reference clock.

The combination of Itai and Belschner fails to teach or suggest each and every limitation of claim 1. In particular, as argued in more detail below, the combination of Itai and Belschner does not teach or suggest "exchanging scheduling information with at least one compatible communication node" and "determining a communication schedule for communications with the

at least one compatible communication node based on the scheduling information," as recited in the claimed invention. In addition, the combination of Itai and Belschner does not disclose or suggest "wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes."

1. The Combination Of Itai and Belschner Does Not Teach "Exchanging Scheduling Information With At Least One Compatible Communication Node" and "Determining A Communication Schedule For Communications With The At Least One Compatible Communication Node Based On The Scheduling Information"

The Patent Office alleges that paragraph 0018 of Itai discloses "exchanging scheduling information with at least one compatible communication node" (Final Office Action mailed March 16, 2010, p. 3). Appellant respectfully disagrees. Paragraph 0018 of Itai discloses a wireless mesh topology network having "mutually interconnected, line-of-sight nodes 12-19." In each time frame, "every node has scheduled slots with which to exchange control information with each of its neighbors." (Itai, paragraph 0018). "Any time a node is not participating in a control channel transmission or reception, it is free to schedule the transmission or reception of data packets." *Ibid.* Appellant initially notes that the nodes in Itai exchange control information, not scheduling information. Moreover, although the nodes in the network of Itai are mutually interconnected, there is no mention that they are "compatible" as defined in the claimed invention. In fact, in Itai, every node communicates with each of its neighbors, which means that Itai does not teach or suggest exchanging scheduling information with "at least one **compatible** communication node."

In contrast, in the claimed invention, the various communication nodes in the wireless access network are configured only to communicate with select compatible communication nodes. Communication links are established between pairs of compatible communication nodes; different communication links may use different modulation, space, time, and/or frequency parameters in order to minimize the potential for one communication link to interfere with other communication links. In this way, the disadvantages of a centralized scheduling scheme are avoided, and there is no need for each of the communication nodes to synchronize to a common time base. Each node will independently determine the communication schedules with its compatible communication nodes.

The nodes in Itai are not configured only to communicate with select compatible communication nodes. The Patent Office is reading "compatible communication node" as a node that "has line of sight communication with at least one neighbor." (Final Office Action mailed March 16, 2010, p. 12). This interpretation of "compatible" is improper because it is inconsistent with how the term is used in the Specification. Paragraph 0007 states in part: "The communication nodes in the wireless communication network are associated with one or more compatible communication nodes through a shared communication medium [which is turned] into a set of substantially non-contending communication links, wherein the communication links within a group of compatible communication nodes are substantially non-interfering." Likewise, paragraph 0020 of the Specification indicates that "the various communication nodes 16 in the wireless access network 14 are configured only to communicate with select compatible communication nodes 16. Communication links are established between pairs of compatible communication nodes 16; different communication links may use different modulation, space, time, and/or frequency parameters in order to minimize the potential for one communication link to interfere with other communication links." Thus, it is clear that "compatible communication node" does not mean any node that has line of sight communication with a neighboring node. Itai does not disclose any determination of compatible nodes and does not disclose that scheduling information is exchanged between compatible nodes.

Itai is silent as to **compatible** network nodes. Itai also does not disclose that a communication schedule is determined for communications with compatible nodes based on the scheduling information exchanged between compatible nodes. Itai discloses that every node communicates with each of its neighbors. Thus, Itai does not teach or suggest "exchanging scheduling information with at least one **compatible communication node** in a wireless communication network" and "determining a communication schedule for communications with the at least one **compatible communication node** based on the scheduling information," as recited in claim 1. Belschner does not cure the deficiencies of Itai in this regard. Since the combination of Itai and Belschner does not teach each and every limitation of claim 1, claim 1 is patentable.

2. The Combination Of Itai and Belschner Does Not Teach "Wherein Communication Nodes In The Wireless Communication Network Independently Determine Communication Schedules With Other Compatible Communication Nodes"

In addition, the combination of Itai and Belschner does not teach or suggest that the communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes, as recited in claim 1. The Patent Office admits that Itai does not teach or suggest that the communication nodes independently determine communication schedules with compatible communication nodes, but argues that the Abstract and paragraph 0025 of Belschner discloses this limitation (Final Office Action mailed March 16, 2010, p. 3). Belschner does not teach or suggest that the communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes, as recited in claim 1. This can be seen from the fact that the a network node in Belschner is integrated as an active node only "if it adapts its local communication time schedule to that of the reference node . . . and if a check as to whether its own communication time schedule agrees with the communication time schedules of at least some of the active network nodes proves positive." (Belschner, Abstract). Further, Belschner makes clear that a "**common** communication time schedule must be established in the network nodes." (Belschner, paragraph 0007, emphasis added). Moreover, the "time schedule is already determined before operation" in Belschner (Belschner, paragraph 0008). In addition, a "common communication time schedule must be established in the network nodes 1 through 4" (Belschner, paragraph 0027). Thus, it is clear that Belschner teaches that a **common** schedule must be determined before operation and therefore Belschner does not disclose or suggest that the communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes, as recited in claim 1.

Belschner does disclose that the network nodes each have a local clock (Belschner, paragraph 0025). However, only the **processing** of a communication time schedule is based on the local clock cycle, not the determination of the schedule. *Ibid.* There is no indication that the node uses the local clock to **independently determine** communication schedules with other

compatible communication nodes, as recited in claim 1. In fact, the local clock of the node in Belschner must be synchronized with a global clock (Belschner, Figure 2 and paragraphs 0025 and 0028) Since Belschner is a synchronized network, there must be a common global clock and the schedules are based on a common clock. In contrast, by independently determining communication schedules with other compatible communication nodes, the communication nodes of the claimed invention "do not need to be synchronized to a central network clock, nor do they need to rely on a central scheduling entity for determining their respective schedules." (Specification, paragraph 0040). The nodes in Belschner do not **independently** determine communication schedules and thus do not provide this benefit of the claimed communication nodes. The Patent Office has admitted that Itai does not teach or suggest this limitation. Thus, the combination of Itai and Belschner does not teach or suggest "wherein communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes," as recited in claim 1. Claim 1 is patentable for this additional reason.

Claims 6-8, 11-13, 16, and 17 depend from claim 1 and include all of the limitations of claim 1. Claims 6-8, 11-13, 16, and 17 are therefore patentable for at least the same reasons set forth above with respect to claim 1. Claim 18 is directed to a system and recites limitations similar to the limitations of claim 1. Claim 18 is thus patentable for at least the same reasons set forth above with respect to claim 1. Claims 23-25, 28-30, 33, and 34 depend from claim 18 and include all of the limitations of claim 18. Claims 23-25, 28-30, 33, and 34 are therefore patentable for at least the same reasons set forth above with respect to claim 18.

E. Claims 2-4, 14, 15, 19-21, 31, and 32 Are Patentable

Claims 2-4, 14, 15, 19-21, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent No. 6,788,702 to Garcia-Luna-Aceves et al. (hereinafter "Garcia").

Claims 2-4, 14, and 15 depend from claim 1 and include all of the limitations of claim 1. Claims 19-21, 31, and 32 depend from claim 18 and include all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Garcia fails to cure the deficiencies of Itai and Belschner in this regard. Thus, claims 2-4, 14, 15, 19-21, 31, and 32 are patentable.

F. Claims 5 and 22 Are Patentable

Claims 5 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and Garcia and further in view of U.S. Patent No. 6,542,476 to Elizondo et al. (hereinafter "Elizondo").

Claim 5 depends from claim 1 and includes all of the limitations of claim 1. Claim 22 depends from claim 18 and includes all of the limitations of claim 18. As set forth above, the combination of Itai, Belschner, and Garcia does not teach or suggest each and every limitation of claims 1 and 18. Elizondo fails to cure the deficiencies of Itai, Belschner, and Garcia in this regard. Thus, claims 5 and 22 are patentable.

G. Claims 9 and 26 Are Patentable

Claims 9 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2003/0067873 to Fuhrmann et al. (hereinafter "Fuhrmann").

Claim 9 depends from claim 1 and includes all of the limitations of claim 1. Claim 26 depends from claim 18 and includes all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Fuhrmann fails to cure the deficiencies of Itai and Belschner in this regard. Thus, claims 9 and 26 are patentable.

In addition, Fuhrmann does not disclose "wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another," as recited in claims 9 and 26. Fuhrmann discloses that a local clock signal, which may be independent from corrections made to a global clock signal (Fuhrmann, paragraphs 0014 and 0015). However, there is no mention that the global and local clock signals in Fuhrmann are associated with the compatible communication nodes of the claimed invention. In fact, the local clock signal in Fuhrmann is derived statically from a quartz oscillator (Fuhrmann, paragraph 0014). Thus, the global clock and the local clock in Fuhrmann are not equivalent to the claimed independent, non-synchronized clocks of communication nodes. Fuhrmann does not teach or suggest that the communication nodes maintain independent clocks, which are not synchronized

with one another, as recited in claims 9 and 26. Claims 9 and 26 are patentable for this additional reason.

H. Claims 10 and 27 Are Patentable

Claims 10 and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2004/0176098 to Besset-Bathias et al. (hereinafter "Besset-Bathias").

Claim 10 depends from claim 1 and includes all of the limitations of claim 1. Claim 27 depends from claim 18 and includes all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Besset-Bathias fails to cure the deficiencies of Itai and Belschner in this regard. Thus, claims 10 and 27 are patentable.

I. Conclusion

The Patent Office has not shown where all the elements of the pending claims are shown in the prior art with sufficient particularity to sustain an obviousness rejection. The combination of Itai and Belschner fails to teach or suggest each and every limitation of independent claims 1 and 18. The combination of Itai and Belschner does not teach or suggest "exchanging scheduling information with at least one compatible communication node" and "determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information," as recited in the claimed invention. In addition, the combination of Itai and Belschner does not disclose or suggest "wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes."

Dependent claims 2-17 and 19-34 are patentable based on their dependency from independent claims 1 or 18. None of the other cited references cure the deficiencies of Itai and Belschner. In addition, claims 9 and 26 recite a separate limitation not taught by the combination of cited references. In particular, Fuhrmann does not disclose "wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another," as recited in claims 9 and 26. Claims 9 and 26 are patentable for this additional reason.

Further, claims 5 and 22 are not indefinite under 35 U.S.C. § 112, second paragraph, for using the term "in a serial fashion." One of ordinary skill in the art having read the Specification (particularly paragraphs 0007, 0008, and 0041) would know what is meant by the term "serial fashion." Claims 5 and 22 are therefore not indefinite. Thus, Appellant respectfully submits that the rejection of claims 5 and 22 under 35 U.S.C. § 112, second paragraph be withdrawn.

As such, for the above reasons, Appellant requests that the Board reverse the Examiner and instruct the Examiner to allow claims 1-34.

Respectfully submitted,

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(8) CLAIMS APPENDIX

2. A method comprising:
   - exchanging scheduling information with at least one compatible communication node in a wireless communication network;
   - determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information; and
   - communicating with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes.

3. The method of claim 1 wherein communications with each of the at least one compatible communication node are established over at least one corresponding communication link, which does not contend with other communication links in the wireless communication network during scheduled communications.

4. The method of claim 1 wherein communications with the at least one compatible communication node are established over a plurality of communication links, which do not contend with each other or with other communication links in the wireless communication network during scheduled communications.

5. The method of claim 1 wherein the at least one compatible communication node is a plurality of compatible communication nodes and at least one communication schedule is established for controlling communications with each of the plurality of compatible communication nodes.

6. The method of claim 4 wherein scheduling embodied in the at least one communication schedule for each of the plurality of compatible communication nodes within the at least one communication schedule is provided in serial fashion.

7. The method of claim 1 wherein the communication schedule provides a schedule for forwarding traffic to or from the at least one compatible communication node.

8. The method of claim 1 wherein the communication schedule provides a schedule for exchanging scheduling information with the at least one compatible communication node.

9. The method of claim 1 wherein the communication schedule provides a schedule for forwarding traffic to or from the at least one compatible communication node and for exchanging scheduling information with the at least one compatible communication node.

10. The method of claim 1 wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another.

11. The method of claim 1 further comprising providing a plurality of queues for traffic to send to the at least one compatible communication node and corresponding to a plurality of quality of service levels, wherein determining the communication schedule provides scheduling sufficient to ensure communications with the at least one compatible communication node occur according to an appropriate quality of service.

12. The method of claim 1 wherein the communication schedule defines transmission opportunities during which communications with the at least one compatible communication node are scheduled to take place.

13. The method of claim 11 wherein the transmission opportunities are variable in length.

14. The method of claim 12 wherein the lengths of the transmission opportunities are based on communication or scheduling related parameters.

15. The method of claim 11 wherein certain packets are scheduled to hop through a plurality of compatible communication nodes during a given transmission opportunity.

16. The method of claim 11 wherein communications with a plurality of compatible communication nodes are scheduled to occur during a given transmission opportunity.

17. The method of claim 1 wherein the scheduling information comprises communication parameter information, and the communication schedule is determined, in part, based on the communication parameter information.

18. The method of claim 1 wherein the scheduling information comprises at least one of collision information pertaining to past transmission opportunities and susceptibility information pertaining to future available transmission opportunities that may likely be subjected to interference.

19. A communication node comprising:
- at least one wireless communication interface; and
- a control system associated with the at least one wireless communication interface and adapted to:
  - exchange scheduling information with at least one compatible communication node in a wireless communication network;
  - determine a communication schedule for communications with the at least one compatible communication node based on the scheduling information; and
  - communicate with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes.

20. The communication node of claim 18 wherein communications with each of the at least one compatible communication node are established over at least one corresponding communication link, which does not contend with other communication links in the wireless communication network during scheduled communications.

21. The communication node of claim 18 wherein communications with the at least one compatible communication node are established over a plurality of communication links,

which do not contend with each other or with other communication links in the wireless communication network during scheduled communications.

22. The communication node of claim 18 wherein the at least one compatible communication node is a plurality of compatible communication nodes, and at least one communication schedule is established for controlling communications with each of the plurality of compatible communication nodes.

23. The communication node of claim 21 wherein scheduling embodied in the at least one communication schedule for each of the plurality of compatible communication nodes within the at least one communication schedule is provided in serial fashion.

24. The communication node of claim 18 wherein the communication schedule provides a schedule for forwarding traffic to or from the at least one compatible communication node.

25. The communication node of claim 18 wherein the communication schedule provides a schedule for exchanging scheduling information with the at least one compatible communication node.

26. The communication node of claim 18 wherein the communication schedule provides a schedule for forwarding traffic to or from the at least one compatible communication node and for exchanging scheduling information with the at least one compatible communication node.

27. The communication node of claim 18 wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another.

28. The communication node of claim 18 further comprising providing a plurality of queues for traffic to send to the at least one compatible communication node and corresponding to a plurality of quality of service levels, wherein determining the communication

schedule provides scheduling sufficient to ensure communications with the at least one compatible communication node occur according to an appropriate quality of service.

29. The communication node of claim 18 wherein the communication schedule defines transmission opportunities during which communications with the at least one compatible communication node are scheduled to take place.

30. The system of claim 28 wherein the transmission opportunities are variable in length.

31. The system of claim 29 wherein the lengths of the transmission opportunities are based on communication or scheduling related parameters.

32. The communication node of claim 28 wherein certain packets are scheduled to hop through a plurality of compatible communication nodes during a given transmission opportunity.

33. The communication node of claim 28 wherein communications with a plurality of compatible communication nodes are scheduled to occur during a given transmission opportunity.

34. The system of claim 18 wherein the scheduling information comprises communication parameter information, and the communication schedule is determined, in part, based on the communication parameter information.

35. The system of claim 18 wherein the scheduling information comprises at least one of collision information pertaining to past transmission opportunities and susceptibility information pertaining to future available transmission opportunities that may likely be subjected to interference.

(9) EVIDENCE APPENDIX

Appellant relies on no evidence outside of the prosecution history, and therefore, this appendix is not applicable.

(10) RELATED PROCEEDINGS APPENDIX

As there are no related proceedings, this appendix is not applicable.